

**FOOD ASSISTANCE AND NUTRITION RESEARCH PROGRAM:
RESEARCH INNOVATION AND DEVELOPMENT GRANTS IN ECONOMICS
(RIDGE)**

2006-07 Project Abstracts

Program Overview

Every year about 1 in 5 Americans is served by 1 or more of the 15 food assistance programs administered by the U.S. Department of Agriculture (USDA). These domestic food assistance programs account for over one-half of USDA's budget and are designed to improve the nutrition, well-being, and food security of needy Americans. To stimulate new research on these programs and to broaden the participation of social science scholars in this area of research, the USDA's Economic Research Service (ERS) established a grants program as part of its Food Assistance and Nutrition Research Program (FANRP) in 1998. Known as the Small Grants Program for its first 8 years, it was renamed the Research Innovation and Development Grants in Economics (RIDGE) Program in 2006. FANRP partners with five academic institutions and research institutes to help administer the RIDGE Program. The institutions are responsible for administering the grant application and peer-review processes.

The objectives of the RIDGE Program are:

- To facilitate informed public debate on the role of food assistance programs in increasing the well-being of poor children and families, the fiscal impacts of these programs, and their relationship to the larger economy;
- To make better use of State and local research to understand program performance and outcomes, as more States add unique features to their welfare programs;
- To deliver research funds to beginning and experienced researchers familiar with the particular characteristics and needs of the poor communities in their States and regions, and;
- To encourage social and nutrition scientists to focus their research and methodological skills on issues of poverty and food assistance.

The five institutions participating in the RIDGE Program include two national research institutes, one regional research center, and two university departments, each with expertise of particular relevance to the study of food assistance programs. Each of the programs focuses on a different aspect of food assistance or subgroup of recipients. The RIDGE grants are competitively awarded for 1-year research projects, with most grants ranging from \$20,000 to \$40,000. The programs and their grant awards for 2006-07 are described in the following sections.

Southern Rural Development Center (SRDC), Mississippi State University

Focus: Food assistance research issues for rural people, families, and communities in the South.
Web address: <http://srdc.msstate.edu/focusareas/health/fa/food.htm>

The South is home to the largest share of rural residents in the United States and has the highest rates of poverty, unemployment, and underemployment in the Nation. The South is also home to the majority of the 1890 land grant universities, included among the Historically Black Colleges and Universities. Through the RIDGE Program, the SRDC seeks to support research activities at these institutions. The SRDC has also initiated a broader dialogue on food assistance research issues in the South through establishment of the Rural South Food Assistance Advisory Committee, which supports the RIDGE Program by selecting research priorities and reviewing grant proposals. Further, SRDC is highlighting RIDGE Program research in its Policy Issues Briefs available on its web site. SRDC is funding four projects for 2006-07.

Exploring Health Literacy as a Factor Contributing to Adoption of the 2005 Dietary Guidelines Among Adults in the Mississippi Delta

Jamie Zoellner and Wendy Bounds, University of Southern Mississippi

Nutrition literacy may be defined as “the capacity to obtain, process, and understand basic nutrition information needed to make appropriate dietary decisions.” This study combines quantitative and qualitative research methodologies to explore nutrition literacy as a mediating factor contributing or inhibiting adoption of the *2005 Dietary Guidelines* among adult Mississippi Delta residents. Trained Community Health Advisors will recruit participants and collect data. The quantitative phase will include a proportional quota sample, based on educational achievement, of 175 participants. Survey instruments include a modified version of the National Cancer Institute’s Health Information National Trends Survey (HINTS) to assess capacity to obtain nutrition information, the Newest Vital Sign (NVS) to assess the capacity to process and understand nutrition information, and a food frequency questionnaire (FFQ) to assess adoption of dietary guidelines. Descriptive statistics will be used to analyze the modified HINTS and multiple Pearson’s correlations will be used to determine the relationship between the NVS score and FFQ dietary variables. Of the 175 respondents, a minimum of 28-35 will be purposefully sampled to complete an additional in-depth qualitative interview to explore culturally appropriate nutrition messages to promote the *2005 Dietary Guidelines*. Interviews will be audio taped, transcribed, and sorted thematically. Main findings will be determined if responses appear consistently throughout an educational stratum or all interviews. Research results will describe practices used to obtain nutrition information, identify a relationship between nutrition literacy and diet quality, and help educators develop culturally appropriate communication strategies and interventions to promote adoption of the *2005 Dietary Guidelines*.

Examining Relations Among Obesity, Food Insecurity, Stress, and Emotional Eating Among Low-Income African-American Women

Carol Connell and Kristi Lofton, University of Southern Mississippi

Amidst a plentiful food environment that is perceived as highly accessible and affordable, research indicates that food insecurity and obesity occur paradoxically. Stress and emotional eating are two psychosocial factors that have been documented to impact eating behavior and weight. Individuals from households that experience food insecurity have reported anxiety and

preoccupation with food among other psychosocial impacts. These stress-related food insecurity experiences may prompt individuals to develop food-related behaviors, such as emotional eating. While some studies have reported a stress/food insecurity relationship, none to date has looked at the impact of stress or emotional eating on the food insecurity/obesity relationship. This study aims to assess whether a relationship exists between food insecurity and overweight/obesity among low-income women in southern Mississippi and to what extent this relationship is moderated by stress and/or emotional eating. A sample of 400 low-income women will be recruited to complete a survey on food security, perceived stress, and emotional eating. Heights and weights of the participants will be measured and body mass index (BMI) calculated in order to determine weight status. Data analysis will explore main effects as well as interaction effects of the independent variables (food insecurity, stress, emotional eating) on the dependent variable (BMI/weight status). Results from this proposed research may be used by policymakers, social service providers, and Head Start administrators to explore programs that would be appropriate to ameliorate food insecurity and overweight among the populations that they serve.

Food Security and Feeding Strategies

Barbara Laraia, University of North Carolina at Chapel Hill

Increasing obesity rates may be heavily influenced by an environment that promotes energy imbalance; however, limited research exists on the relationship between environmental influences and weight status. While weight status is increasing among all sectors of the population, greater than 10 percent of U.S. households experience food insecurity, in which 20 percent of U.S. children are living. Among the characteristics most associated with food insecurity are low-income status, being single, being Black, and having children. The paradox of hunger among plenty has been amplified by an association between household food insecurity and overweight in women, although this association has not been found among children. One hypothesis is that although children might be protected with regard to weight status, the stressful experience of being in a food-insecure household might influence feeding strategies early in life that may in turn impact eating behaviors, diet, and weight outcomes later in life. Psychological challenges that families face are important in understanding the pathway between household food insecurity and health outcomes. The study will use data from the Infant Care Project, a National Institutes of Health-funded cohort study of low-income, first-time African-American mothers that has collected myriad data on socioeconomic, household dynamic, psychosocial factors, eating patterns, and feeding strategies. Using multivariate analysis, the study proposes to identify modifiable risk factors associated with household food insecurity to inform intervention strategies to prevent overweight. Results from these analyses will help inform a larger grant proposal that will aim to test hypotheses generated using a nationally representative dataset.

Impact of Local Food Prices on the Relationship Between Food Stamp Program Participation and Bodyweight Status of Adults in the South

Qi (Harry) Zhang, Old Dominion University, and Zhu (Adam) Chen, University of Chicago

The purpose of this study is to investigate the association between local food prices and body weight of adults who are eligible for the Food Stamp Program (FSP). The Southern States observe the highest regional prevalence of obesity and overweight people in the United States, while the regional FSP participation rates are above the national average. Some evidence suggests that FSP participation may distort participants' food consumption choices, making participants prone to obesity. However, the possible impact of local food prices on the body weight of FSP

participants has yet to be considered. The study will use the Metropolitan Statistical Area (MSA) and County codes to merge data from the National Longitudinal Study of Youth 1979 cohorts (NLSY79) with the Cost of Living Index published by the American Chamber of Commerce Researchers Association (ACCRA). Using the merged data, the study will employ panel econometric models to examine the impact of prices of various foods (healthy vs. unhealthy) on the body weight status of adults with low socioeconomic status. The hypothesis is that local food prices could affect FSP participants' food consumption choices and hence affect their bodyweight status. The results of this study could provide implications for policymakers on whether adjustment of the FSP benefits based on local food prices should be considered to alleviate the potential distortion of food consumption.

The American Indian Studies Program (AISP), The University of Arizona

Focus: The relationship between food assistance programs on reservations and family poverty.

Web address: www.nptao.arizona.edu

Information on the need, use, and impact of food assistance programs by Native Americans, particularly those on Indian Reservations, is limited. Many Native Americans face severe economic challenges characterized by high unemployment rates, severe poverty, nutrition challenges, and interaction with multiple governmental organizations. Many also live in areas of low population density typified by long distances to population centers, which further hinders access to jobs and services.

Providing the only doctoral program in Native American Studies in the United States, and by virtue of its close relationship to tribal researchers, AISP is the ideal partner for the RIDGE Program. AISP works with Native American researchers across the country to support research addressing the unique position and problems of Native Americans with respect to food assistance. The AISP grants program helps build the research capacity of Native American scholars and fill the research gap on Native American use of food assistance programs. This year, AISP awarded four grants.

The Cost and Availability of Healthier Foods for the Pascua Yaqui Pueblo and the Old Nogales Highway Colonia: Community Baselines and Benefits of Mobile Markets

Dr. George Frisvold, The University of Arizona (continuing grant with the Tucson Community Food Bank—new grant administrator via the University of Arizona)

The project will examine the cost and availability of basic food items and healthier alternatives for residents of the Pascua Yaqui Pueblo (New Pascua), the Old Pascua Village, and the Old Nogales Highway Colonia. Research will also examine how Tucson Community Food Bank's Mobile Markets reduce food costs, increase availability of healthier items, or both at two of the sites (Old Pascua and Old Nogales Highway Colonia). Market basket surveys of the cost of purchasing the Thrifty Food Plan and a healthier alternative will be conducted for 33 grocery stores around Tucson and the 2 Mobile Markets. Sites will be surveyed three times each throughout the life of the grant. The project will provide dollar value estimates of potential household cost savings from participation in the Mobile Market program. It will also provide estimates of the impact of the Mobile Market on the cost and availability of healthier alternatives and on customer purchasing behavior.

Expansion of a Small-Scale Integrated Aquamethaponics Food Production System and Training Program for Native Hawaiian Working Families in Hawaii

Aecio Silva, The University of Arizona, and Robert Howerton, University of Hawaii

In collaboration with the Maui Community College (MCC), the Sustainable Living Institute of Maui (SLIM), and the Paia Learning Center, the project will recruit five additional Native Hawaiian families and train them in producing food, including fish and vegetables, in small-scale integrated aquaculture-agriculture systems. Advanced research will be conducted concerning the Waianae diet and utilizing project technology to expose a larger number of working, low-income Native Hawaiian families to traditional healthy foods through the aquamethaponics system.

Understanding Traditional Foods Security of Hopi Single-Parent Headed Households: Outreach to the Hopi Community and its Organizations”

Matt Livingston, Hopi Cooperative Extension Office, and Cornelia Butler Flora, Iowa State University

The second phase of this project will be to move the research findings and action plans from the previous contract year to action, working with youth-serving organizations to develop action research strategies with youth, schools, and village activities. Training will be provided to four Hopi community representatives for the current survey instrument. The community representatives will work with the Hopi Office of Community Health representatives in developing up-to-date information, including, but not limited to, a revised Hopi cookbook, newspaper articles, and community focus groups. The research team will complete the data analysis and triangulate findings during community presentations.

Measuring Food Purchases, Community Needs, and Tribal Policy for Healthy Foods in Local Grocery Stores on and Near a Northern Plains Indian Reservation

Blakely Brown, University of Montana

The project director and associate researchers will conduct assessments of the food environment in convenience stores on and near a rural Northern Plains Indian reservation. Information will be collected about availability and demand for healthy foods from store managers and shoppers. Additionally, a validated survey will be conducted to determine use of community food sources, participation in food assistance programs, and other resources that would be useful for improving nutrition, diet, health, and the reservation food culture of community members. Further, the project will assess tribal policies that impact the availability of healthy foods in stores. Collectively, these pilot data will be used to develop and implement strategies for increasing healthy foods in local grocery stores on and near the research site.

Institute for Research on Poverty, University of Wisconsin-Madison

Focus: The impacts of food assistance programs on food security, income security, and other indicators of well-being among low-income individuals and families.

Web address: <http://www.irp.wisc.edu/initiatives/funding/usdasgsp.htm>

The Institute for Research on Poverty (IRP) is a national, university-based center for research into the causes and consequences of poverty and social inequality in the United States. It was

established in 1966 at the University of Wisconsin-Madison by the U.S. Office of Economic Opportunity, the organization given responsibility for reducing poverty in America. Since IRP's inception, its multidisciplinary affiliates have formulated and tested basic theories of poverty and inequality, developed and evaluated social policy alternatives, and analyzed trends in poverty and economic well-being. IRP is funding four studies in 2006-07.

The Effects of the Food Stamp Program on Weight Gained by Expectant Mothers

Charles L. Baum, Middle Tennessee State University

This study will examine the effects of the Food Stamp Program on the amount of weight gained by mothers (of singleton live births) during their pregnancy, using data from the 1979 cohort of the National Longitudinal Survey of Youth. Because food stamp benefits may affect pregnancy weight gain by increasing the rate of gain and by lengthening the pregnancy, a portion of the models will estimate the partial effect of benefits on weight gain by holding pregnancy length constant. Supplemental models will (1) examine whether benefits have different effects for mothers with different pre-pregnancy weights (underweight, normal weight, overweight, and obese), (2) examine whether the effects of these benefits depend on pregnancy-trimester of receipt, and (3) simultaneously assess the effect of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

Food Stamps, Quality of Food Consumption, and Obesity

Neeraj Kaushal, Columbia University

This project examines the effect of changes in the food stamp caseload induced by welfare reform on the quantity and quality of food consumption and prevalence of obesity in low-educated, single-mother families. The study will use two data sets: Consumer Expenditure Survey data for 1993-2001 and National Health Interview Survey data for the same years. A comparison research design will separate the effect of factors contemporaneous with welfare reform from its effect on quantity and quality of food consumption and obesity.

Measuring the Impacts of Stigma and Time Cost in the Food Stamp Enrollment Decision

Diane Whitmore Schanzenbach, University of Chicago

This project will conduct a randomized trial of a food stamp outreach program during the 2007 tax season, in partnership with H&R Block, to measure the fraction of eligible low-income working families who are enrolled in the program in San Francisco and Alameda counties, CA. Low-income clients who come to H&R Block to prepare their taxes and who appear to be eligible for food stamps will be given information about the program. The context of providing information about the program will be varied, and various levels of assistance with filing the paperwork will be given, ranging from no special assistance to actually filing the application on the client's behalf. This experiment can provide useful information to policymakers as they assess the potential effect of simplifying enrollment procedures and of marketing campaigns. It can also inform the economics literature about the magnitude of stigma effects and enrollment costs on program participation.

The Effects of School Feeding Programs and Maternal Employment on Children's Meal and Activity Patterns

Geetha M. Waehrer, Pacific Institute for Research and Evaluation

Using time diary information from the 2002 Child Development Supplement of the Panel Study of Income Dynamics, this study will analyze schoolchildren's eating and activity patterns in connection with the School Breakfast Program and with maternal employment. Research has been inconclusive on the question of whether the breakfast program increases the likelihood of eating breakfast among participating children. Hypothesized mechanisms for a causal effect of maternal employment on childhood obesity include unhealthy snacking and reduced physical activity among the unsupervised children of working women. The project will use 24-hour time diaries for 1 weekday and 1 weekend day for approximately 2,850 children ages 6-18. Endogeneity in program participation will be accounted for by comparing differences in breakfast patterns between weekdays (when school breakfasts are available) and weekends (when they are not available) among program participants and nonparticipants. A similar strategy will exploit the reduction in work effort from weekdays to weekends to estimate maternal employment effects.

The Irving B. Harris School of Public Policy Studies, University of Chicago

Focus: Interactions between food assistance programs and other welfare programs and the effects of the macroeconomy on the need for food assistance, level of participation, and food assistance program costs.

Web address: <http://www.jcpr.org/usdagrants.html>

The Irving B. Harris School of Public Policy Studies at the University of Chicago supports academic research that examines the meaning of being poor in America. Its partnership with ERS began in 2003 when the Harris School inherited responsibilities from the Joint Center for Poverty Research (JCPR). The Harris School's research focuses on the interactions between food assistance and other welfare programs, the linkages between the macroeconomy and food assistance, and the level of participation and costs of food assistance programs. The goal of the Harris School is to advance knowledge about the economic, social, and behavioral factors that cause poverty and to establish the actual effects of interventions designed to alleviate poverty. Four studies are being funded in 2006-07.

Estimating the Impact of Food Insecurity on Health Outcomes in the Presence of Food Insecurity Reporting Errors

Craig Gundersen, Iowa State University

Relationships between food insecurity and negative health outcomes have been widely documented. Previous research, spanning numerous academic studies, has found that members of households suffering from food insecurity are more likely to incur compromised psychosocial functioning, frequent stomachaches and headaches, obesity, depression, multiple chronic conditions, lower health outcomes across the SF-36 scales, increased odds of being hospitalized, higher levels of hyperactivity, and greater propensities to having seen a psychologist. Consistently negative health findings emerge from a variety of data sources,

employ a variety of statistical techniques, and appear to be robust to different measures of food insecurity.

Given these negative connections between food insecurity and health outcomes, a comprehensive analysis of the economic and social benefits of reducing food insecurity must account for potential improvements in health outcomes. While previous work has identified associations between food insecurity and poor health, it has not estimated casual impacts of reducing food insecurity. Moreover, the literature has implicitly assumed that food insecurity is measured without error. Recent research has shown that even a small degree of misreporting of food insecurity status can overturn conclusions about relationships between food insecurity and the receipt of food stamps. Similarly, conclusions about the impacts of policies designed to ameliorate food insecurity might depend critically on assumptions regarding the reliability of self-reported food insecurity data.

The study proposes a nonparametric econometric framework for making inferences about relationships between food insecurity and health outcomes. Using data from the 2003-04 National Health and Nutrition Examination Survey (NHANES), the study proposes to address the following questions:

- How does health status vary across reportedly food-secure and food-insecure households?
- What can be learned about relationships between health status and “true” food insecurity status given uncertainty about the nature and degree of food insecurity reporting error?
- How would a government policy that ameliorated or eradicated food insecurity affect health status within the low-income population?

The study’s nonparametric strategy for bounding parameters of interest will apply and extend methods developed in previous studies. Under conservative nonparametric assumptions, the framework used in the study will allow accounting for uncertainty about both counterfactual outcomes and about status quo food insecurity status.

Expected results will help inform researchers and policymakers about important health consequences of policies designed to ameliorate food insecurity. While the proposed project will focus on health, the framework can be used to study a wide range of other outcomes associated with food insecurity.

Food Stamps Receipt and Food Insecurity After Welfare Reform: Links to Health and Behavior Among Low-Income Immigrant and Native Children

Ariel Kalil, University of Chicago

The 1996 Federal welfare reform law introduced, among other things, broad restrictions on immigrants’ eligibility for many health and social service programs, including Food Stamps. Caseloads for Food Stamps and other benefit programs have fallen dramatically in the wake of welfare reform, but the declines have been steeper for immigrants than for native-born citizens even when immigrant families remain eligible for assistance. Importantly, eligible children of immigrant noncitizens experienced more persistent and higher levels of food insecurity than children of citizens,

and this in part reflects their lower rates of food stamp participation. What is virtually unknown is whether these patterns have any implications for child well-being.

The present study will rely on five waves of data (1998-2003) from a nationally representative data set, the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K). Drawing on a subset of approximately 3,500 low-income children (approximately one-third of whom are immigrants), this project will answer the following questions, using multivariate methods appropriate for longitudinal data:

- How do patterns of food stamp receipt in the post-welfare reform period (1998-2003) differ for low-income children of immigrants versus natives?
- How do experiences of food insecurity in the post-welfare reform period (1998-2003) differ for low-income children of immigrants versus natives?
- Do patterns of food stamps receipt in the post-welfare reform period (1998-2003) relate differentially to changes in health and behavior in low-income immigrant vs. native children and can this be explained by differences in food insecurity?

Few contemporary studies offer as sizable a sample of young, low-income immigrant children as does the ECLS-K, while also providing rich measures of child health and well-being, participation in public programs, and experiences of food insecurity over a period that spans the whole of children's primary school years. This research has significant policy implications, given that 56 percent of young children of immigrants are low income, experience food insecurity, and may face barriers to accessing the public programs that could support their health and well-being.

Improving Our Information on Who Receives Food Stamps and the Program's Effects on Income and Consumption

James Sullivan, Notre Dame University

This project aims to improve our understanding of the extent of underreporting of food Stamps in large, household surveys and to determine how underreporting might bias studies of the Food Stamps Program (FSP). These biases are likely to be large given significant evidence of underreporting of food stamps in surveys, particularly in recent years. This project will account for underreporting in analyses of FSP receipt and the distributional effects of the program using a variety of methods. First, the study constructs a number of different measures of underreporting rates in four nationally representative datasets that are used by researchers to study the FSP: the Current Population Survey, the Panel Study of Income Dynamics, the Survey of Income and Program Participation, and the Consumer Expenditure Survey. The study will do this by comparing weighted aggregates from these surveys with aggregates from administrative reports or derived from the FSP Quality Control Database. With these data, the study also constructs underreporting rates that vary with individual characteristics. Second, the study will determine the degree to which survey-based measures of take-up are biased by underreporting by adjusting existing estimates and by estimating its own measures of take-up. In the latter approach, the study proposes a new method for adjusting for underreporting bias by combining survey microdata and administrative microdata. Lastly, the study will conduct analyses of the distributional consequences of the FSP that adjust for underreporting. These analyses are likely to show that the distributional effects of the FSP are greater than has been suggested by previous studies.

Food Stamp Program and Women, Infants, and Children: Effect on Children's Health and Nutrition

Kathleen Ziol-Guest, Harvard University

The Food Stamp Program (FSP) serves as the first line of defense against hunger, enabling low-income families to buy nutritious food in authorized retail food stores. The FSP is the cornerstone of the Federal food assistance programs and provides crucial support to needy households and to those making the transition from welfare to work. For many low-income households, food stamp benefits represent an important share of household resources. Over 21 million people per month participated in the FSP in 2003, where 55 percent of the participants were children. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) serves an alternate function and works to safeguard the health of low-income women, infants, and children up to age 5 who are at nutritional risk by providing nutritious foods to supplement diets, information on healthy eating, and referrals to health care.

Both of these programs are designed to address the nutritional and health needs of the low-income population. However, despite this aim, the impacts of these programs on children's health and nutrition remain poorly understood. This project uses restricted data from both the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) and the Fragile Families and Child Wellbeing Study (FF) to investigate whether participation in the FSP or WIC relates to child well-being. Specifically, the study will:

- Document FSP and WIC participation of families with young children (newborn to age 3).
- Assess the association between FSP and child health, cognitive assessments, and socioemotional development.
- Assess the association between WIC and birth outcomes, including breastfeeding, child health, cognitive assessments, and socioemotional development.
- Address the endogeneity of FSP and WIC participation to quantify effects of participation on child outcomes.

The restricted-use ECLS-B and FF are ideal data sets with which to address these questions. The ECLS-B enables the measurement of WIC participation while pregnant to examine birth outcomes and infant health, as well as the influence of FSP participation on children's health at age 2. The FF dataset allows examination of the association between FSP or WIC and preschool age children's health, controlling for often not-available characteristics of parents and families. Neither of these datasets has been used to examine these research questions; further, this study will use an Instrumental Variables approach to account for the potential endogeneity of program participation using restricted data that identifies State- or city-level characteristics. Propensity score matching techniques will also be tested as another mechanism to account for selection bias in understanding the influence of participation on children's health and well-being. Results from this study will address an important public policy issue—namely whether or not programs designed to improve the health and well-being of low-income children are successful. In addition, it will provide information on young children's development and health as opposed to school-age children or adolescents, which from a national perspective, there is little information.

The Department of Nutrition at the University of California, Davis

Focus: The impact of food assistance programs on nutritional risk indicators (anthropometric, biochemical, clinical, and dietary), food purchasing practices, and food insecurity.

Web address: <http://nutrition.ucdavis.edu/USDAERS/>

The Department of Nutrition at the University of California, Davis, is internationally recognized for its leadership in both nutrition education and research. The Nutrition Education Research Group is a collaboration of faculty in the department with interests in the design and evaluation of nutrition education programs. A central focus of their efforts has been to identify approaches to curriculum development and evaluation that are meaningful in ethnically diverse, low-income communities served by food assistance programs. This group, together with faculty from Departments of Agricultural and Resource Economics at the University of California at Berkeley and Davis, administers the RIDGE Program to support research on the nutritional effects of food assistance. Their program emphasizes multidisciplinary approaches, the link between nutrition indicators and other measures of well-being and program costs, and the impact of relationships between poverty and obesity that may not be addressed by food assistance programs. Three research projects are funded for 2006-07.

A Longitudinal Study of Food Insecurity/Insufficiency on Overweight in Preschool Children
Elizabeth Metallinos-Katsaras, Simmons College

The objectives of this research are to (1) assess how food security and food sufficiency status varies as the duration and timing of participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) changes and (2) improve understanding of the role of food insecurity and food insufficiency in the development of healthy weight versus overweight in early childhood in a population at high risk for food insecurity. This study will use food security and sufficiency data collected since 2000 by all WIC programs in Massachusetts as well as the sociodemographic and anthropometric data collected as part of the CDC Pregnancy and Pediatric Nutrition Surveillance Systems. Data from 2002-06 (inclusive) will be used. Food security was assessed using the "Threshold Subscale," a 4-question module based on questions at the threshold cut points for different levels of food security status in the original version of the 18-question module. On children, both the timing of WIC services as well as effect of duration in WIC will be assessed on changes in food security and sufficiency throughout the course of WIC participation. To assess effects of timing, three cohorts will be created, all of which have been in WIC for at least 2 years: (1) birth-23 months, (2) 12 -35 months, and (3) 24-48 months. Duration will be assessed by comparing changes in food security/sufficiency between those receiving WIC for 1 year compared with 2 years within similar cohorts (that is, timing kept constant) but will include children of different durations. To assess effects of WIC participation on pregnant women the following analyses will be conducted: (1) longitudinal changes in these measures (between first and third trimesters) for women certified (first time participants only) during their first trimester, and (2) a cross-sectional comparison of women's food security and sufficiency status at the third trimester between women certified in their first trimester and those certified in their third trimester of pregnancy.

To assess the relationship between household food insecurity/insufficiency and childhood weight gain and overweight, a two-stage approach will be used. First, multivariate linear and logistic regression will be used to analyze associations of weight, weight gain, and overweight (body mass index (BMI)-for-age \geq 95 percentile using Centers for Disease Control and Prevention reference data) at ages 3, 4, and 5 with food insecurity and food insufficiency at earlier ages. Patterns of food insecurity over time will be identified (possible examples: never food insecure, persistently food insecure, generally improving food security, generally deteriorating food security, in-and-out hovering on the edge of food insecurity). Households will be classified accordingly. The associations between these patterns and early childhood weight gain (change in BMI z-score) and overweight will be studied while controlling for race/ethnicity, sex, age, and maternal education. In stage 2, a fixed-effects model will be used with the goal of measuring the association between food security/sufficiency status and weight status while controlling for both other observable confounding variables and unobservable confounding variables (so long as the unobservable confounding variables are constant over time). The significance of this research lies in its being one of the few longitudinal studies to assess the relationship between household food insecurity/insufficiency and overweight in children, an obviously important public health problem, in a low-income population. The latter group is most deeply affected by food insecurity. Taken together, the results of the WIC timing and duration on food insecurity/insufficiency and those of food insecurity/insufficiency's relationship to weight status can provide important insight as to how WIC may affect weight status through effects on food security/sufficiency.

The Direct Economic Effects of a Policy to Provide Government-Subsidized Price Discounts for the Purchase of Fruits and Vegetables by Food Stamp Recipients

Karen M. Jetter, University of California, Davis

The purpose of this research project is to evaluate the direct benefits and costs to consumers and producers from changes in prices, consumption, and production of a policy to offer government price discounts on fresh fruits and vegetables to food stamp recipients. Increased consumption of fruits and vegetables has been linked to a decrease in dietary-related chronic diseases, such as heart disease, diabetes, and some cancers. Low socioeconomic status (SES) is strongly associated with higher rates of obesity and high rates of the leading causes of illness and death. Diet may play an important mediating role in explaining socioeconomic disparities in health status. Consequently, developing cost effective policies that lead to higher consumption of fruits and vegetables may have a significant impact on the incidence of chronic disease among persistent food stamp recipients.

Targeted assistance has been shown to be more efficient at bringing about dietary changes than more general assistance programs. Therefore, a targeted food assistance program, such as price discounts on fruits and vegetables, may provide substantial benefits to low-income consumers. Providing price discounts of 25 percent, 50 percent, or 75 percent also directly benefits food stamp consumers through lowering the prices that they pay for fruits and vegetables. However, a price discount may cause equilibrium market prices to rise for fruits and vegetables, benefiting growers but making other consumers worse off.

This study will use a market model of the U.S. fruit and vegetable industry to estimate the benefits and costs to consumers, growers, and taxpayers. The benefits from changes in the incidence of chronic diseases in persistent food stamp recipients are also important but beyond the scope of this project.

Dietary Behaviors That Promote Overconsumption: Are Food Insecurity and Food Assistance Program Participation Associated With Energy Imbalance?

Claire Zizza, Auburn University

Previous studies have proposed that food insecurity and hunger could coexist with obesity within the same individual. The limited research in this area suggests that a relationship between food insecurity and obesity does not exist among men or among children. However, relationships have been found among women. Dietary factors that have been linked to the overconsumption of energy include meal and snack patterns and caloric density of foods. The purpose of this study is to examine the snacking behavior and energy density of the diets among adults with various levels of food security. The study will also determine the major food sources of energy and their respective eating occasion among adults with various levels of food security. These relationships will be further expanded to include the associations with food assistance programs. In particular, the study will include participation in the Food Stamp Program (FSP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

The National Health and Nutrition Examination Survey (NHANES) 1999-02 dataset will be used for this study. This dataset contains information regarding people's food security, food assistance participation, dietary intakes, as well as other health-related information and demographic and socioeconomic characteristics. This work will focus on individuals ages 19-60. The NHANES surveys are multistage, stratified area probability samples. To account for sample design and sampling weights, the study will use STATA (Version 8, College Station, TX) to estimate all descriptive and inferential statistics. To control for possible confounders in the analysis, regression techniques appropriate for the exposure and outcome will be used. For example, when examining the associations of food insecurity with energy and other macronutrient intakes, the study will use ordinary linear regression. However, when examining the probability of snacking, the study will employ logistic regression models.

This work will provide a valuable description of the diets of adults with various levels of food insecurity and will be useful in guiding administrative aspects of food assistance programs. There has been a call to change the FSP so that it employs inclusion food lists. Implementing an inclusion list would strengthen the nutritional benefit of the FSP and the results from this work would be useful in developing such a list. The results from this research can be also be used by the Food Stamp Nutrition Education (FSNE) and the Expanded Food and Nutrition Education Program (EFNEP) to help design research-based obesity prevention/treatment campaigns. Such campaigns should include messages that target snacking behavior. Results are expected to show that the consumption of fruits and vegetables is not adequate in food-insecure individuals. Proposing the introduction of fruits and vegetables as snacks may be an important message that would both increase fruit and vegetable consumption and replace other calorie-dense snack foods. In another avenue, results from this work could be informative in designating evaluation criteria for FSNE. Being able to document characteristics of snacking behavior is important when examining diet quality. Given the emphasis in the *2005 Dietary Guidelines* on maintaining a healthy weight, measures of diet quality should address behaviors that may result in overconsumption.